

METHOD AND APPARATUS FOR CONTROLLING ULTRASONIC TRANSDUCER

ABSTRACT OF THE DISCLOSURE

Method and apparatus for implementing ultrasonic systems that maximize efficiency by dynamically detecting and maintaining peak operational resonance frequency. In one embodiment, the invention dynamically sweeps the output frequency range to locate the peak load current. The resonance frequency corresponding to the peak load current is used as a reference frequency in a control loop. The control loop includes a voltage-controlled oscillator (VCO) that is controlled by a loop controller and operates to lock onto the dynamically sensed reference frequency. In response to the VCO output, a pulse-width modulator (PWM) circuit drives a pair of switches that adjust transducer current to maintain the circuit locked on the resonance frequency at a substantially constant current.

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